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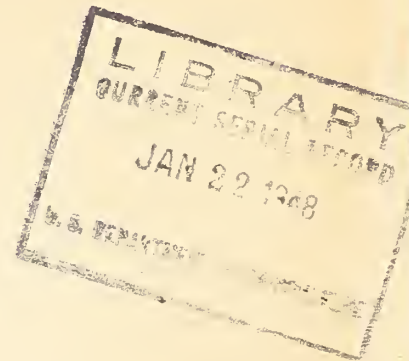
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December, 1947

United States Department of Agriculture
Bureau of Animal Industry
Animal Husbandry Division
Washington, D.C.

x Karakul Sheep Investigations of the
Bureau of Animal Industry

by
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Mr. President and members of the Karakul Fur Sheep Registry, this opportunity to participate in your annual meeting is appreciated.

Karakul sheep breeding investigations of the Bureau of Animal Industry are being conducted for the purpose of determining the properties of Persian lamb fur, produced by Karakul sheep, with respect to various degrees in the merits of such fur, and to study the basis of inheritance for such important characteristics as curl, luster, and color.

Records are kept in such a way as to comply fully with the rules and regulations of the Karakul Fur Sheep Registry for reporting characteristics of the fur of purebred Karakul lambs when making application for their registration, including size of curl, type of curl, luster, quality, density, and size of pelt. Additional characteristics of or affecting the fur are also studied so that the full schedule of fur characteristics includes (a) size of lamb or pelt, (b) length of gestation period, (c) size of curl, (d) tightness or compactness of curl, (e) luster, (f) pattern, (g) general desirability, (h) length of the lamb's wool fiber, and (i) thickness of the skin.

The Bureau's flock of breeding sheep and lambs for this research work now totals 162 of which 13 are rams and ram lambs, and 149 are ewes and ewe lambs. Of these same 162 sheep, 52 are purebred Karakuls. The other 110 are top-cross Karakuls of which 33 are from a foundation of Blackface-Highland ewes, 41 are from a Corriedale ewe foundation, and 36 are from an old type Navajo ewe foundation. These 110 top-cross Karakuls average 89.8 percent pure Karakul, and of them the 33 that have been bred up from the foundation of Blackface-Highland ewes average 97.5 percent pure Karakul, the 41 bred up from the Corriedale ewe foundation average 96 percent pure Karakul, and the 36 bred up from the foundation of old type Navajo ewes average 75.7 percent pure Karakul.

*Review presented at the annual meeting of the Karakul Fur Sheep Registry in the Stevens Hotel, Chicago, Ill., at 10:15 A.M., December 5, 1947.

When the Bureau began establishing its Karakul flock in 1928, select purebred registered ewes and a choice purebred registered ram were obtained from the late Mr. F. E. Dawley of Fayetteville, New York. Soon thereafter there were added some of the best purebred registered ewes that the Bureau could purchase from the Texas Experiment Station. About 1930, a search was made at lambing time by inspection of leading Karakul flocks of the United States in an effort to get definite information on the Karakul sheep that were producing the best lambskin fur, and selections of some of the best purebred, registered sheep of these Karakuls were obtained by the Bureau for its flocks at Beltsville, Maryland.

The scarcity of purebred Karakuls in our country was recognized as a condition that would result in many Karakul sheepmen trying to increase the numbers of ewes of Karakul inheritance by breeding white wool ewes to purebred Karakul rams and then grading-up to high degrees of Karakul inheritance by top-crossing the crossbred ewes and their ewe descendants to purebred Karakul rams for a number of generations so as to use them in the production of valuable Persian lamb fur.

In order to study the possibilities of this system of breeding, the Bureau purchased a flock of Blackface-Highland ewes and placed them at Beltsville in the fall of 1928 for mating with purebred Karakul rams. About a year later the Bureau placed a choice selection of its Corriedale ewes in this experiment for mating with Karakul rams, and in 1940 obtained a choice flock of old type Navajo ewes at Fort Wingate, New Mexico, and placed them at Beltsville for mating with Karakul rams. These experiments have been continued until the present time. The results show that the rate at which grading-up for fur quality progresses seems to be a function of the wool fineness of the ewes. Improvement in the quality of the fur by generations of top-crossing has been most rapid with the Navajo ewe foundation which ewes have fleeces of coarse wool, the rate of improvement was second with the Blackface-Highland ewe foundation which ewes have fleeces of rather coarse wool, and this fur improvement was least rapid with the Corriedale ewe foundation which ewes have fleeces that grade on the fine side of medium wool.

It appears that further improvement in fur quality must be accomplished through the rigid selection of Karakul rams that have been proved for their ability to transmit the most desirable fur qualities. This has been practiced continuously with the purebred flock of Karakuls at Beltsville. Along with this system of selective mating, line breeding has been practiced, but in such a way as to avoid intensive inbreeding and the possibility of extreme segregation. For example, with two sire lines the daughters of line A are mated with the rams of line B and the daughters of line B are mated with rams of line A. This is an example of the way we are using the best sires for line breeding.

You will be interested to know that results of this breeding program show definite improvement. Averages of the raw lambskins last year, when prices for Persian lambskins were quite high, were around \$9.00 to \$10.00 per pelt. We still have considerable variation in the valuations placed on these lambskins in the New York market ranging from \$1.00 to \$18.00 per pelt. In round numbers, 10 percent of these recent pelts were valued at \$15.00 to \$18.00, about 40 percent of them at \$10.00 to \$15.00,

around 30 percent at \$5.00 to \$10.00, and the remaining 20 percent were appraised at values below \$5.00. While there is yet much improvement to be accomplished the upward trend is encouraging.

While working on the improvement of the fur, we have undertaken to determine the extent of the breeding season of Karakul sheep and possibilities of obtaining more than one lamb crop a year. Ewes of various ages were kept with rams at all times from July 1, 1942, to March 31, 1946, a period of 3 3/4 years. Conception among the non-nursing and otherwise dry ewes occurred principally during August to November and most frequently during September and October. Approximately 12 percent of the ewes conceived during July, December, January, and February. A few ewes conceived in March, one in May and none in April and June. About 25 percent of the ewes that were nursing lambs during September, October, and November conceived during these months. Within a year, the rates of conception were 120 per 100 ewes for ewes that were not raising their lambs, and 103 per 100 ewes that nursed lambs. The results indicate that, under conditions at Beltsville, the possibilities of obtaining an extra lamb crop per year from Karakul ewes is very limited.

We would appreciate definite data on the experiences of others who may be conducting breeding programs in such a way as to determine the possibilities of obtaining more than one Karakul lamb crop a year.

Last year, the Bureau conducted an experiment at Beltsville on the influence of nutritional differences on the quality of lambskins produced by Karakul ewes. As you know, there is a diversity of opinion regarding the effects of nutrition on the production of lambskin fur. Some producers and breeders contend that Karakul ewes fed on high levels of nutrition produce a higher quality of lamb fur than those in lean condition. Others believe that pregnant Karakul ewes in a high state of condition tend to produce lambs with overgrown fur, a characteristic that reduces the market value. We have reasoned that if Karakul sheepmen could be informed as to the nutritional conditions best suited to lambskin production, it would be of economic importance to them. This project was therefore designed to obtain that information.

The object of this undertaking was to determine the effects of feeding Karakul ewes at low and high levels of nutrition during pregnancy on such factors of lambskin production as (a) size of lamb or pelt, (b) length of gestation period, (c) size of curl, (d) tightness of curl, (e) luster, (f) pattern, (g) general desirability, (h) length of the lamb's wool fiber, and (i) thickness of the skin of lambs.

About 100 Karakul ewes were in this experiment, and they were divided into two lots of about 50 ewes each. These lots were designated A and B. The ewes of both lots were kept on the same pasture throughout the pasture season. During the feeding season of late fall, winter, and early spring, while the ewes were pregnant, and until lambing time, ewes of Lot A were fed on a low level of nutrition and ewes of Lot B on a high level of nutrition. The low level was just sufficient to maintain a normal weight with only enough gain permitted to approximate the weight of the unborn lambs, while the high level was a full feed that resulted in considerable gain. Both lots were fed cracked corn, whole oats, corn gluten feed, and linseed meal, as concentrates, together with alfalfa hay

and corn silage. The proportions of the different kinds of concentrates were the same for both lots, but the quantities of the mixture differed.

The results of this experiment show no significant influence of nutrition on any of the nine characteristics of the fur from the lambs of these ewes. But the influences of sire differences were very significant for birth weight, size of curl, tightness or compactness of curl, luster, and general desirability of the fur. This experiment is being repeated this winter in an effort to determine whether it is really true that wide differences in the nutrition of Karakul ewes during pregnancy do not affect the characteristics of the fur of their lambs. This report on last years' trial is given for your information, but it is not yet accepted as conclusive.

In repeating this trial this winter, we are switching the lots so that the ewes that were fed on a low level of nutriton last year will be fed on a high level this year, and the ewes that we fed on a high level last year will be fed on the low level this year.

Should we eventually find that lamb fur is not significantly affected by the nutrition of the mother ewe during pregnancy, it may be considered as good fortune for breeders. It would mean that they could safely conclude that differences due to sires are free from confusions due to variations in nutrition. It would more firmly establish the reliability of the progeny test for proving the prepotency of sires, and their ability to transmit the desirable fur characteristics.